1. An apparatus for delay domain multiplexing of digital data signals using orthogonal encoding, the apparatus comprising:

input paths configured to carry first and second digital data signals comprising bits having a bit time corresponding thereto;

a source configured to provide laser pulses;

first and second photonic encoders configured to convert the laser pulses into first and second sets of orthogonal codes extending for the bit time;

first and second photonic modulators configured to modulate the first and second sets in accordance with the first and second digital data signals to provide first and second modulated signals corresponding thereto;

first and second delay mechanisms configured to provide first and second delayed copies corresponding to the first and second modulated signals delayed by first and second delays, respectively; and

first combiners configured to combine the first and second delayed copies with the first and second modulated signals, respectively, to form first and second consolidated modulated signals corresponding thereto, respectively.

2. The apparatus of claim 1, further comprising a multiplexing combiner configured to combine the first and second consolidated modulated signals into a single multiplexed output for transmission over a carrier medium.

3. The apparatus of claim 2, further comprising:

a splitter configured to receive and split the single multiplexed output into first and second daughter signals;

third and fourth delay mechanisms configured to provide third and fourth delayed copies corresponding to the first and second daughter signals delayed by the first and second delays, respectively; and

second combiners configured to recombine the third and fourth delayed copies with the first and second daughter signals, respectively, to form third and fourth consolidated modulated signals.

4. The apparatus of claim 3, further comprising first and second decoders configured to receive the third and fourth consolidated modulated signals and extract the first and second digital data signals therefrom.

5. The apparatus of claim 4, wherein:

the digital data signals are characterized by a bit duration; and

each laser pulse has a duration not greater than the bit duration divided by a number of digital data signals to be multiplexed.

6. The apparatus of claim 5, wherein the first and second sets of orthogonal codes are Walsh codes.

7. The apparatus of claim 5, wherein the first and second sets of orthogonal codes correspond to delays selected to incur phase shifts of 0° and 180° in a signal coded thereby.

8. The apparatus of claim 7, wherein the first and second photonic encoders comprise a plurality of optical paths, having lengths selected to impose one of the first and second orthogonal codes on the laser pulses.

9. The apparatus of claim 1, wherein the duration of each laser pulse is not greater than the bit duration divided by the number of digital data signals multiplexed.

10. The apparatus of claim 1, wherein the first and second sets of orthogonal codes are Walsh codes.

11. The apparatus of claim 1, wherein the first and second sets of orthogonal codes correspond to delays selected to incur phase shifts of 0° and 180° in a signal encoded thereby.

12. The apparatus of claim 1, wherein the first and second photonic encoders comprise a plurality of optical paths, having lengths selected to impose one of the first and second orthogonal codes on the laser pulses.

13. A method for delay-domain multiplexing of digital data signals using orthogonal encoding, the method comprising:

providing first and second digital data signals comprising bits having a bit duration;

providing laser pulses corresponding to the bits;

encoding the laser pulses to provide first and second orthogonal codes, each extending for the bit duration;

modulating the first and second orthogonal codes with the first and second digital data signals to provide first and second modulated signals;

providing delayed copies of the first and second modulated signals, delayed by first and second delays, respectively; and

recombining the delayed copies with the first and second modulated signals to form first and second consolidated modulated signals.

14. The method of claim 13, wherein the first and second consolidated modulated signals are combined into a single multiplexed output for transmission over a carrier medium.

15. The method of claim 14, further comprising:

splitting the single multiplexed output to provide first and second daughter signals;

providing first and second delayed copies the first and second daughter signals, respectively;

combining the first and second delayed copies with the first and second daughter signals, respectively, to provide third and fourth consolidated modulated signals.

16. The method of claim 15, further comprising extracting the first and second digital data signals from the third and fourth consolidated modulated signals.

17. The method of claim 16, wherein the duration of each laser pulse is not greater than the bit duration divided by the number of digital data signals multiplexed.

18. The method of claim 17, wherein the first and second orthogonal codes are Walsh codes.

19. The method of claim 18, wherein the first and second sets of orthogonal codes correspond to delays selected to incur phase shifts of 0° and 180° in a signal encoded thereby.

20. The method of claim 19, wherein encoding the laser pulses comprises providing a plurality of optical paths, having lengths selected to impose one of the first and second orthogonal codes on the laser pulses.